Directions: Please complete shaded areas below.

Department Name: ETSD
Project Name: Data Asset Protection/Data Storage
Project Amount: $1,200,000
Preparer Name & Contact Information: Bob Ashby, 305-596-8269

Project Type: Please check (√) one.

X	**Enterprise**	☐	**Communities of Interest**	☐	**Department Specific**

Funding Source: Please check (√) one.

X	**GF Capital**	☐	**Proprietary Capital**

☐ **Mandated Requirement**
(If checked (√), please indicate who is mandating this request as well as the time frame)

1 **Department Priority of Initiative (1, 2, 3, etc.)**

Section A

Background:
Provide any relevant background information to include existing investments in the proposed project. If applicable, please include any information explaining why this is a mandated project.

In the distributed environment disk storage requirements are growing at a rapid rate both through existing application growth and the addition of new applications. ETSD is deploying an average of one Terabyte a month of storage in support of these requirements. To put this into perspective, a terabyte of storage would hold the equivalent of 65 Million 8-page Word documents. The sum total of this disk storage which contains critical data is housed on Storage Area Networks (SANS). Approximately two years ago a "Distributed Backup Architecture" was adopted that is both robust and scalable enough to meet this massive growth. Requests to fund this architecture to ensure that critical files are being backed-up to tape media have **not been** funded adequately nor has the replacement of four of the existing Storage Area Network devices that have reached their end of lice-cycle and must be replaced.

This is the second year that a request is being made to provide sufficient tape backup capacity to meet the needs of the existing quantity of deployed storage used to house over 200 mission critical databases and applications, departmental data, files and applications. This is also the second year a request is being made to replace these "end of life" storage infrastructure with newer, faster, more reliable units to meet Enterprise systems availability requirements and not impact the critical shared data and file areas providing services to all downtown users and departments (SPCC campus) and other County-wide departments and locations, including Elections.

Problem Statement:
Define the problem, need, or opportunity.

DISTRIBUTED BACKUPS -
Mainframe backups and distributed backups are fundamentally different. Mainframe backup infrastructures are designed to backup large amounts of small files. Hence the appropriateness of acquiring the recently installed Virtual Tape System (VTS). Distributed environments are designed to backup very large amounts of data (fewer files, but larger in size). The largest disk "file" defined on the Mainframe is 500 gigabytes; the largest file on the distributed environment is 2 Terabytes and growing (4 to 1 ratio). Total disk storage on the mainframe is 5.2 terabytes; The total disk storage on the distributed environment is approximately 120 Terabytes (this is a 24 to 1 ratio). Backing up the distributed environment to the mainframe environment is expensive, time consuming and a waste of resources. For example, a database that is backed up on the Mainframe tape backup infrastructure that uses 500 tapes per month would only require 50 tapes per month on the distributed infrastructure. Data transfer (disk to tape) rates are different as well with the distributed environment writing to tape twice as fast as the mainframe and server connections to the distributed tape backup infrastructure 11 times faster. These increases in speed and capacity are required to meet the needs to backup the distributed storage architecture. The distributed backup environment as it is now is, inadequate for the existing distributed disk storage and is falling further behind as we deploy more disk storage to accommodate new applications and existing applications populate their allocated storage with more and more production data.

There is simply no additional capacity to add additional backup jobs to the distributed environment. Because we are at 100% of capacity, drastic measures have been taken to alleviate the situation. Nightly full backup (all files) that were previously scheduled have been changed to incremental (changed files only) with a full backup now scheduled weekly, meaning that some files are now only backed up on a weekly basis. Over the last 6 months, the distributed backup architecture has seen a 50% growth in backup jobs and is currently backing up over 1 Terabyte, nearly 4 million, files nightly. Although this will provide some level of recoverability in the event of a failure, the restore process will take longer, leading to extended outages, impacting application availability and ultimately information and service delivery to the citizen.

Last fiscal year $900,000 was spent on new distributed disk storage. Only $65,000 was spent on the backup infrastructure. As of the writing of this document there has been (or is in process) expenditures of $850,000 for disk storage and $125,000 for backup facilities. If the rate keeps up we will expend in excess of $2,000,000 on disk storage this fiscal year. Current utilization of the existing backup infrastructure is at 100% with no ability to add any new backups to the current environment. Without backup the County will be vulnerable to unrecoverable loss of data and systems unavailability. Loss of data will impact applications availability, and service delivery to departments and the citizens of Miami-Dade County.

The backup architecture adopted for the distributed environment is sound and has virtually unlimited growth potential providing the proper resources are made available. Continuing to backup distributed applications to the mainframe will in a short time period exhaust the capacity that was added with the recently installed VTS (Virtual Tape System).

Storage Area Network (SAN) REPLACEMENT
There are 4 older SANS (two at the SPCC and two at ETSD) that are "end of life". These SANS are five years old and need to be replaced (the architecture is even older). These units are currently used in support of the Exchange environment for email access and storage and for shared file areas that are used by multiple departments and agencies throughout the county including, the Mayor's Office, County Manager, Commissioners, Revitco Building, Parks, Seaport, Elections, Public Works and others. The older SAN architecture was one of the first SANS to be acquired by the county and have a maximum capacity of 3 terabytes. The newer SAN technologies can hold up to 40 terabytes in the same space. The older units also lack the diagnostic capabilities of newer models and because of their age are becoming more and more prone to failure. Although we have not experienced a hardware failure affecting production systems, we are experiencing increasing component failures that to date have been recoverable without yet affecting system availability. Given the age of the technology and the length of time these units have been in production, failures affecting the customer base will become a reality.

This is the second year that a request is made to replace these aging units. Good business practice dictates that these units are replaced prior to a failures affecting a wide range of very heavy users. The Exchange e-

mail environment has become a business mission critical for departments County-wide and is currently served by this infrastructure. Additionally, user and department data and files are located on these devices which would also impact departmental operations if they are unavailable. Failure of these older SAN devices will have a major impact to County operations through extended outages, impacting service delivery to the Citizen.

Solution:
What is the proposed solution?

(In priority order)

Proposed Solution Descriptions	Project Components	Component Price
DATA/ASSET PROTECTION PROJECT		
...Software Licenses	Product Licenses for all Four locations Planned (SPCC, ETSD, MDPIC, MDFR).	$187,062
...Hardware Acquisitions	Automated Tape Libraries and Server Equipment for all Four locations Planned (SPCC, ETSD, MDPIC, MDFR).	$592,200
...Consulting Services	Vendor Consulting Service to Provide for product configuration and interface development.	$107,376
	Data/Asset Protection Project Sub-Total…….	$886,638
DATA STORAGE REPLACEMENT PROJECT		
...Hardware Acquisitions	Replacement of four existing Storage Area Network Devices which are currently at end-of-life-cycle with state-of-the-art technology to improve reliability and availability.	$313,362
	Data Storage Replacement Project Sub-Total..	$313,362
	Business Case Aggregate Grand-Total….	$1,200,000

Expected Benefits / Direct Payback:
State the benefits of solving the problem or reaching the goal. Hints: "How the project will reduce costs (perhaps from reducing redundant tasks such as data entry), better decision making at each step of a process (perhaps due to more accurate and timely information), or improved efficiency (thanks to fewer steps to process a transaction).

Specify collective benefits and identify benefits that are specific to each stakeholder. Wherever there are metrics (numbers or targets) for improvement, be sure to include them. Examples: "Reduce communications costs by 20%" or "Increase revenues by $1,340,500 in fiscal year 2007.

DISTRIBUTED BACKUP
There will be no reduction in operational cost associated with this request. However, there will be a cost avoidance. Currently, we are unable to guarantee good, reliable, backups and restores for the existing amount of storage in the distributed environment. If this project is funded as requested, the consequences of a failure on a production system will be minimized, enabling ETSD to recover and restore services in a timely manner.

If this request is **not funded** a failure in a production system will result in permanently lost data. The impact of this in actual dollar cost or lost productivity would depend on the amount of data and the applications affected. Loss of data will increase costs to the County as revenue generating services are unavailable. Additional costs will be incurred by the County through the efforts required manually re-creating the data, if even possible. Finally, extended systems outages will impact departmental and Internet based applications availability and delivery of services and information vital to the Citizens of Miami-Dade County.

SAN REPLACEMENT
There will be no significant reduction in operational cost associated with this request. There is a benefit of being able to put more data into a physically smaller space at the SPCC and at ETSD, where computer room space is at a premium. As in the distributed backup request above, there will be a cost avoidance. Failure of the existing older technology HSG SANS is difficult to diagnosis and component failure is increasing due to the age of the equipment and the technology. Replacement of these units will provide a predictable, highly available, scalable environment with improved management and problem reporting/diagnostics which will increase reliability of the environment supporting business mission critical applications such as e-mail and departmental file shares and applications.